34. DRYING & GAS OR VAPOR CONTACT WITH SOLIDS.
177

109 1/2

EXAMINER
EXAMINER.

(No Model.)

J. WALES.

GRAIN DRIER.

No. 363,865. Patented May 31, 1887.

Fig. 1.

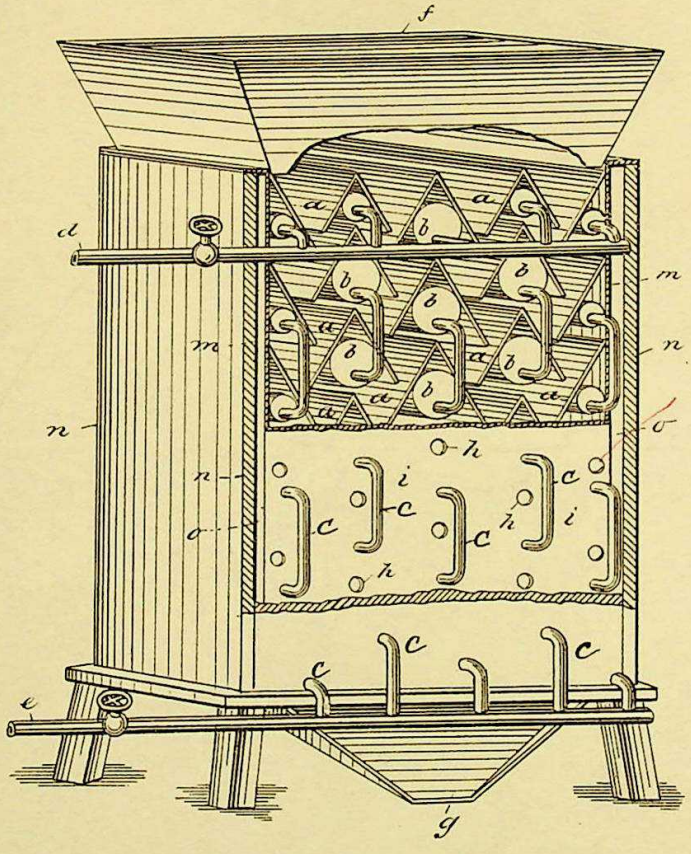
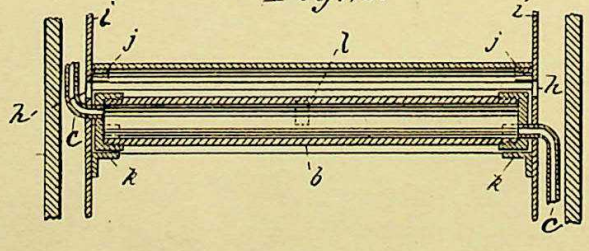


Fig. 2.



WITNESSES

D. J. Morgan
E. H. Morgan

INVENTOR

Joseph. Wales.
By A. P. Thayer
atty.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

JOSEPH WALES, OF EAST ORANGE, NEW JERSEY.

GRAIN-DRIER.

SPECIFICATION forming part of Letters Patent No. 363,865, dated May 31, 1887.

Application filed May 14, 1885. Renewed July 15, 1886. Serial No. 208,086. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH WALES, a citizen of the United States, residing at East Orange, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Grain-Driers, of which the following is a specification.

My invention consists of improvements in the construction of that class of grain-driers in which the grain is caused to descend in zigzag courses along inclined plates arranged in horizontal and vertical series and heated by steam applied under the plates, the object being to contrive a simpler and cheaper construction, and to provide for greater security against the pressure of the steam, all as hereinafter fully described, reference being made to the accompanying drawings, in which—

Figure 1 is a perspective view of a drier constructed according to my invention, with part of the case broken out. Fig. 2 is a detail in transverse section of the drier.

Hitherto this form of grain-drier has been made of cast-metal tubes of large size in triangular or approximately-triangular shape, adapted to form the zigzag shelves or plates to be heated, and for the flow of the grain slowly down along them, said tubes having closed ends, into which the steam-pipes are tapped for the circulation of the steam. The large sizes necessary to afford the desired breadth of the sloping plates exposes so much area of flat sides to the bursting pressure of the steam that the castings have to be made very thick and heavy to provide the necessary strength, which makes these driers very expensive for material, besides being heavy and expensive for transportation and construction.

My invention consists, essentially, of the contrivance of the sloping plates or shelves of thin rolled-metal Λ-shaped plates *a* for the grain to flow on, with common light-weight rolled-metal steam-heating pipes *b*, located under the plates, the said plates and heaters being arranged substantially in the same order as in the previously-constructed driers of this character—that is, so that grain descending between the plates and escaping from the lower edges of one plate will be directed onto the middle, or thereabout, of the side of the plate next adjacent thereto and a little lower, and the apexes are located in suitable relation with the plates above to prevent the grain from reaching the top of them, and the pipes are connected together for the circulation of steam by the short bent pipes *c*, and have supply-pipe *d* and discharge-pipe *e* suitable for maintaining a circulation through them for heating the plates to dry the grain descending along said plates, as above described, the grain being spouted into the hopper *f* at the top and escaping from the hopper *g* at the bottom, where a gate or slide will be employed in practice to regulate the flow of the grain through the drier; but in this arrangement air charged with moisture from the grain collects in the spaces under the apexes of the plates and flows along to the vent-holes *h*, which I make in the side plates, *i*, of the case coincident with said spaces. In practice the air may be exhausted by a fan arranged to draw from the spaces at the sides of the drier into which these vents discharge.

This contrivance of the Λ-shaped drying-plates, in combination with steam-pipes *b* for the heaters, makes an exceedingly efficient construction as compared with combined plates and steam-pipes heretofore made and used for this form of drier, which, being made of cast-iron, have to be made very thick to sustain the pressure, and consequently are expensive and heavy to handle, and, at best, are not very reliable for resisting the pressure, whereas by the use of ordinary steam-pipe for the heaters *b* and plain flat sheet metal for the plates *a*, I have far greater strength to sustain the steam-pressure, and much lighter material to handle, and of much cheaper cost. The plates, being cut to the proper length and breadth, have merely to be bent along the apex, and the heaters *b*, having ordinary steam-pipe caps at the ends, will have the circulating-pipes screwed into the holes tapped in them for the purpose.

Any approved studs or brackets, *j*, may be attached to the side plates, *i*, for support of the ends of the heating-plates, and similar supports, *k*, may be provided for the ends of the heated pipes. The plates *a* or the heater-pipes may have intermediate beams, *l*, to support the plates sufficiently above the heater-pipes for providing the space for the air to rise into the angles above the pipes for escape at the vents *h*.

The heaters are inclosed in the metallic case *i m*, or it may be wood; and I propose to inclose said case in a larger wood case, *n*, with dead-air spaces *o*, to economize the heat.

What I claim, and desire to secure by Letters Patent, is—

In a grain-drier of the character herein described, the shelves or inclined plates consisting of the rolled-metal Λ-shaped plates *a*, made separately from the heaters and being independent of the steam-pressure, in combination with heaters consisting of separate steam-pipes located under the plates, and having the usual pipe-connections for the circulation of the steam, substantially as described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSEPH WALES.

Witnesses:
W. J. MORGAN,
S. H. MORGAN.